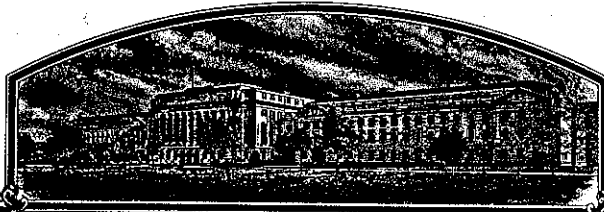


No.

8900214



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Northrup King Co.

Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S), AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'S31-33'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D. C. this 30th day of September in the year of our Lord one thousand nine hundred and ninety-one.

Attest:

Kenneth H. Evans

Commissioner

Plant Variety Protection Office

Agricultural Marketing Service

E. L. Madigan
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

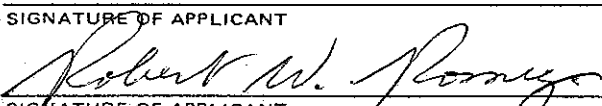
1. NAME OF APPLICANT(S) Northrup King Co.		2. TEMPORARY DESIGNATION X8832, W318303		3. VARIETY NAME S31-33	
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) P. O. Box 959 Minneapolis, MN 55440		5. PHONE (Include area code) 612-593-7333		FOR OFFICIAL USE ONLY PVPO NUMBER 8900214	
6. GENUS AND SPECIES NAME Glycine max		7. FAMILY NAME (Botanical) Leguminosae		FILING DATE May 15, 1989 TIME 2:00 <input type="checkbox"/> A.M. <input checked="" type="checkbox"/> P.M.	
8. KIND NAME Soybean		9. DATE OF DETERMINATION January, 1987		FEE RECEIVED AMOUNT FOR FILING \$1800.00 - 350.00 DATE May 15, 1989; May 22, 1989 AMOUNT FOR CERTIFICATE \$250.00 DATE August 26, 1991	
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation					
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware				12. DATE OF INCORPORATION 1976	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Robert W. Romig Northrup King Co. P. O. Box 959 Minneapolis, MN 55440 PHONE (Include area code): 612-593-7305					
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.) b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement. c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.) d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of Variety. e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership.					
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) <input type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below) <input checked="" type="checkbox"/> No					
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> Yes <input type="checkbox"/> No			17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> Foundation <input type="checkbox"/> Registered <input type="checkbox"/> Certified		
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? <input type="checkbox"/> Yes (If "Yes," give date) <input checked="" type="checkbox"/> No					
19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> Yes (If "Yes," give names of countries and dates) <input checked="" type="checkbox"/> No					
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF APPLICANT 				DATE May 11, 1989	
SIGNATURE OF APPLICANT				DATE	

EXHIBIT A

Origin and Breeding History of the Variety

1977-80 - The Northrup King soybean research group at Washington, Iowa made a series of crosses and intercrosses involving germplasm with resistance to cyst nematode. The sequence of crossing in the population designated WX1922 is as follows:

- 1977. Made cross designated WX1334 = 'A1564' x 'Mack'
- 1978. Made cross designated WX1488 = WX1334 F_3 x 'Bedford'
- 1979. Made cross designated WX1738 = WX1488 F_3 x Bedford.
- 1980. Made cross designated WX1922 = WX1738 F_3 x L77-994
L77-994 is a germplasm release which was the progenitor of the variety 'Fayette'.

1980-82 - The population designated WX1922 was advanced to F_6 . In October, 1982, we selected 100 plants of Group IV or earlier maturity and threshed them individually.

1983 - We grew each of the 100 plant selections in an F_7 progeny row. One of these, numbered W318303, was selected on the basis of agronomic appearance to be tested in a preliminary yield trial. This line was subsequently named S31-33.

1984-85 - We tested S31-33 in replicated yield trials at several midwestern locations and found it to yield acceptably in comparison to other early Group III varieties. We tested it for cyst nematode resistance in the greenhouse at Bolivar, TN and Stanton, MN, and in the field on infested soil near Conesville, Iowa. We identified and confirmed the descriptive characteristics white flowers, tawny pubescence, tan pods, black hila, and shiny seed coat luster.

In the winter of 1985-86 we initiated seed increase from approximately 500 grams of carefully hand rogued seed. We removed all plants not conforming to the variety description by roguing the increase block several times.

1986-88 - We continued to test S31-33 in advanced yield trials to confirm descriptive characteristics and performance. We confirmed resistance to cyst nematode on infested soils near Conesville, Iowa and St. Joseph, Illinois. We also sent samples to Dr. Lawrence Young, USDA Nematology Laboratory, Jackson, TN who verified that S31-33 is resistant to Races 3 and 4.

We grew Breeder Seed of S31-33 in 1986 from the initial increase grown the previous winter. The field was rogued several times. We also grew 100 progeny rows to monitor within line variability and to Produce Pedigree Seed. The variety was uniform. We produced Breeder Seed again in 1987 and Foundation Seed in 1988. The Iowa Crop Improvement Association inspected the Foundation field and

found it to meet the requirements for Foundation Seed. The National Soybean Variety Review Board approved S31-33 for Certification on December 8, 1988.

S31-33 is a stable and uniform soybean variety. It may contain up to 2% seed with hilum color other than black. In 6 years of testing and four cycles of seed increase, we have observed no other variants except minor environmentally induced variation normally encountered in a soybean variety.

We will maintain varietal purity by use of progeny rows as needed.

EXHIBIT B**Novelty Statement for the Variety**

Soybean variety S31-33 is most similar to A3307 and Pella. It can be differentiated from Pella on the basis of flower color. S31-33 has white flowers while Pella has purple flowers. It can be differentiated from A3307 on the basis of plant height. S31-33 is approximately 14 cm shorter than A3307.

Data demonstrating plant height difference between S31-33 and A3307.

<u>Variety</u>	<u>Average</u>	<u>Plant Height, cm</u>					
		<u>Washington, Iowa</u>			<u>St. Joseph, Illinois</u>		
		<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
S31-33	93	103	104	85	97	89	82
A3307	107	110	109	100	119	102	101
LSD	6	7	6	9	6	6	9

S31-33 is also similar to the varieties 3081, 4280, 9361, A4268, B335, CX 380, Moore 4650, S435, SS 391, SS 443 and Williams. It can be differentiated from all these varieties on the basis of resistance to cyst nematode (*Heterodera glycines*). S31-33 is resistant to Race 3 of cyst nematode while all of the other varieties listed are susceptible.

U.S. DEPARTMENT OF AGRICULTURE
 AGRICULTURAL MARKETING SERVICE
 LIVESTOCK, MEAT, GRAIN & SEED DIVISION
 PLANT VARIETY PROTECTION OFFICE
 BELTSVILLE, MARYLAND 20705

EXHIBIT C
 (Soybean)

OBJECTIVE DESCRIPTION OF VARIETY
 SOYBEAN (*Glycine max* L.)

NAME OF APPLICANT(S) Northrup King Co.	TEMPORARY DESIGNATION X8832, W318303	VARIETY NAME S31-33
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) Northrup King Co. Attention: R.W. Romig P. O. Box 959 Minneapolis, MN 55440		FOR OFFICIAL USE ONLY VPPO NUMBER 8900214

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g.,). Starred characters ★ are considered fundamental to an adequate soybean variety description. Other characters should be described when information is available.

1. SEED SHAPE:



1 = Spherical (L/W, L/T, and T/W ratios = ≤ 1.2)

3 = Elongate (L/T ratio > 1.2 ; T/W = ≤ 1.2)

2 = Spherical Flattened (L/W ratio > 1.2 ; L/T ratio = ≤ 1.2)

4 = Elongate Flattened (L/T ratio > 1.2 ; T/W > 1.2)

★ 2. SEED COAT COLOR: (Mature Seed)

1 = Yellow

2 = Green

3 = Brown

4 = Black

5 = Other (Specify) _____

3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

1 = Dull ('Corsoy 79'; 'Braxton')

2 = Shiny ('Nebsoy'; 'Gasoy 17')

★ 4. SEED SIZE: (Mature Seed)

Grams per 100 seeds

Compared to Pella at 17.

★ 5. HILUM COLOR: (Mature Seed)

1 = Buff

2 = Yellow

3 = Brown

4 = Gray

5 = Imperfect Black

6 = Black

7 = Other (Specify) _____

May contain up to 2% other hilum.

★ 6. COTYLEDON COLOR: (Mature Seed)

1 = Yellow

2 = Green

★ 7. SEED PROTEIN PEROXIDASE ACTIVITY:

1 = Low

2 = High

★ 8. SEED PROTEIN ELECTROPHORETIC BAND:

1 = Type A (SP1^a)

2 = Type B (SP1^b)

★ 9. HYPOCOTYL COLOR:

1 = Green only ('Evans'; 'Davis')

2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')

3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')

4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

★ 10. LEAFLET SHAPE:

1 = Lanceolate

2 = Oval

3 = Ovate

4 = Other (Specify) _____

11. LEAFLET SIZE:

☒ 21 = Small ('Amsoy 71'; 'A5312')
3 = Large ('Crawford'; 'Tracy')

2 = Medium ('Corsoy 79'; 'Gasoy 17')

12. LEAF COLOR:

☒ 21 = Light Green ('Weber'; 'York')
3 = Dark Green ('Gnome'; 'Tracy')

2 = Medium Green ('Corsoy 79'; 'Braxton')

★ 13. FLOWER COLOR:

☒ 1

1 = White

2 = Purple

3 = White with purple throat

★ 14. POD COLOR:

☒ 1

1 = Tan

2 = Brown

3 = Black

★ 15. PLANT PUBESCENCE COLOR:

☒ 2

1 = Gray

2 = Brown (Tawny)

16. PLANT TYPES:

☒ 21 = Slender ('Essex'; 'Amsoy 71')
3 = Bushy ('Gnome'; 'Govan')

2 = Intermediate ('Amcor'; 'Braxton')

★ 17. PLANT HABIT:

☒ 3

1 = Determinate ('Gnome'; 'Braxton')

2 = Semi-Determinate ('Will')

3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

★ 18. MATURITY GROUP:

☐ 6

1 = 000

2 = 00

3 = 0

4 = I

5 = II

6 = III

7 = IV

8 = V

9 = VI

10 = VII

11 = VIII

12 = IX

13 = X

★ 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

BACTERIAL DISEASES:

★

☐Bacterial Pustule (*Xanthomonas phaseoli* var. *sojensis*)

★

☒ 1Bacterial Blight (*Pseudomonas glycinea*)

★

☐Wildfire (*Pseudomonas tabaci*)

FUNGAL DISEASES:

★

☒ 1Brown Spot (*Septoria glycines*)Frogeye Leaf Spot (*Cercospora sojae*)

★

☐

Race 1

☐

Race 2

☐

Race 3

☐

Race 4

☐

Race 5

☐

Other (Specify)

☐Target Spot (*Corynespora cassiicola*)☐Downy Mildew (*Peronospora trifoliorum* var. *manshurica*)☐Powdery Mildew (*Microsphaera diffusa*)

★

☒ 1Brown Stem Rot (*Cephalosporium gregatum*)☐Stem Canker (*Diaporthe phaseolorum* var. *caulivora*)

19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

FUNGAL DISEASES: (Continued)

- ★ ☒ 1 Pod and Stem Blight (*Diaporthe phaseolorum* var. *sojae*)
- ☒ 1 Purple Seed Stain (*Cercospora kikuchii*)
- ☐ Rhizoctonia Root Rot (*Rhizoctonia solani*)
- Phytophthora Rot (*Phytophthora megasperma* var. *sojae*)
- ★ ☒ 1 Race 1 ☒ 1 Race 2 ☒ 1 Race 3 ☒ 1 Race 4 ☒ 1 Race 5 ☒ 1 Race 6 ☒ 1 Race 7
- ☒ 1 Race 8 ☒ 1 Race 9 ☐ Other (Specify) _____

VIRAL DISEASES:

- ☒ 1 Bud Blight (Tobacco Ringspot Virus)
- ☐ Yellow Mosaic (Bean Yellow Mosaic Virus)
- ★ ☐ Cowpea Mosaic (Cowpea Chlorotic Virus)
- ☐ Pod Mottle (Bean Pod Mottle Virus)
- ★ ☒ 1 Seed Mottle (Soybean Mosaic Virus)

NEMATODE DISEASES:

- Soybean Cyst Nematode (*Heterodera glycines*)
- ★ ☐ Race 1 ☐ Race 2 ☒ 2 Race 3 ☒ 2 Race 4 ☐ Other (Specify) _____
- ☐ Lance Nematode (*Hoplolaimus Colombus*)
- ★ ☐ Southern Root Knot Nematode (*Meloidogyne incognita*)
- ★ ☐ Northern Root Knot Nematode (*Meloidogyne Hapla*)
- ☐ Peanut Root Knot Nematode (*Meloidogyne arenaria*)
- ☐ Reniform Nematode (*Rotylenchulus reniformis*)
- ☐ OTHER DISEASE NOT ON FORM (Specify): _____

20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

- ★ ☒ 1 Iron Chlorosis on Calcareous Soil (Moderately susceptible)
- ☐ Other (Specify) _____

21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

- ☐ Mexican Bean Beetle (*Epilachna varivestis*)
- ☐ Potato Leaf Hopper (*Empoasca fabae*)
- ☐ Other (Specify) _____

22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	Pella 86	Seed Coat Luster	Fayette
Leaf Shape	S30-31	Seed Size	S34-19
Leaf Color	A3307	Seed Shape	Fayette
Leaf Size	S29-20	Seedling Pigmentation	A3307

23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/POD
				CM Width	CM Length	% Protein	% Oil		
Submitted	120	2.3	93	5.4	10.3	41.2	20.0	15.0	2-3
Pella* Name of Similar Variety	119	2.3	100	6.1	10.6	39.8	21.4	16.8	2-3

PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A₂ in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

*Pella 86 in 1988, Pella in 1986 and 1987.

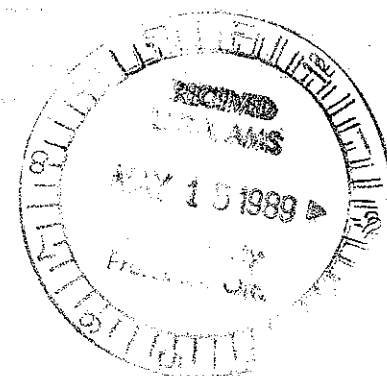


EXHIBIT D

Additional Description of the Variety

Soybean variety S31-33 is an early Group III maturing one day later than Pella. It has normal tolerance to metribuzin herbicide.

EXHIBIT E

Statement of the Basis of Applicant's Ownership

Soybean variety S31-33 was developed by the Northrup King Co. soybean breeding staff from germplasm sources cited in Exhibit A of this application. Northrup King Co. believes that the variety is novel as defined in the Plant Variety Protection Act and, therefore, that Northrup King Co. is the sole owner of the variety.